 Name _____

Integrative Biology 200B Spring 2003

"PRINCIPLES OF PHYLOGENETICS: ECOLOGY AND EVOLUTION"

Quiz 1

1. (25 points) Briefly describe the following concepts; giving the most important and/or controversial points, and the assumptions that must be made.

a. the relationship between phylogenetics & conservation?

b. vicariance biogeography

c. coalescence theory

d. Brook's parsimony

e. monophyletic species?

2. (20 points) Briefly contrast the following pairs of terms (Use diagrams if they help):

Strict consensus trees vs. majority-rule consensus trees

transformational vs. taxic homology

replicator vs. interactor

neoteny vs. progenesis

3. Short answers -- based on lab **(20 points)**:

A. If you run a maximum parsimony analysis in PAUP without specifying an outgroup, are the resulting trees rooted or unrooted? Next, if you define an outgroup taxon and re-run the analysis with the same matrix,will your topology potentially change?

B. Give one example of any reason that might justify applying a differential weighting scheme (i.e., aside from all characters having equal weight) to you data matrix.

C. Give one example of any reason that might justify ordering your characters.

D. Explain how Bremer support (Decay indicex) differs from bootstrap values and describe how to calculate Bremer support using Tree-View and PAUP.

4. (25 points) What sort of comparative method or approach would you apply to the following evolutionary questions (e.g., what assumptions would you make, what kind of data would you require, how would you generate a null hypothesis, how would you judge statistical significance?):

a. (5 pts.) Has a particular clade of parasitic plants closely co-evolved with its clade of host plants?

b. (5 pts.) Are fleshy-fruited plants more likely to evolve a dioecious condition (i.e., separate sexes on different individuals)?

c. (5 pts.) Is molecular evolutionary change concentrated in speciation events?

d. (5 pts.) Is copious nectar production is an adaptation for hummingbird pollination in flowering plants.?

e. (5 pts.) There is trend towards increasing body size within lineages of mammals (Cope's Rule).

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